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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,179	10/20/2003	Seung Eon Moon	51876P400	3926
8791 7590 01/17/2007 BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			EXAMINER AUSTIN, AARON	
			ART UNIT 1775	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/17/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/690,179	Applicant(s) MOON ET AL.	
	Examiner Aaron S. Austin	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (US 7,145,412).

Hunt et al. teach an apparatus comprising a microwave tunable device (col. 4:27). The device may include an MgO substrate (col. 9:22). A BST ferroelectric/dielectric layer is deposited on the substrate (col. 8:59-60). An interdigital single layer electrode pattern is formed on the BST layer and separated from the MgO substrate (col. 5:61-64).

Hunt does not teach the BST film as being oriented in a (111) direction when applied to an MgO substrate. However, Hunt does teach an embodiment wherein the substrate is e-plane sapphire and the BST applied thereto is in the (111) orientation (col. 14:1-3). Therefore, as Hunt clearly teaches BST applied in the (111) direction provides the advantage of a ferroelectric/dielectric with the benefits of the taught invention, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the BST film in the (111) direction on the other substrates

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taught, including MgO. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 1 and 8, the recitation of "a phase array antenna system" and "a satellite communication system" is considered intended use. In addition, devices as taught by Hunt et al. are known components of phase array antenna systems and satellite communication systems.

Regarding claims 2 and 9, the BST film completely covers the substrate (Fig. 17).

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (US 7,145,412) in view of Chang (US Patent Application No. 2003/0022030).

Hunt et al. teach an apparatus as described above.

Hunt does not teach the BST film as being oriented in a (111) direction when applied to an MgO substrate.

In addition to the argument set forth above, Chang teaches a dielectric device formed of BST (paragraph [0006]) in a (111) orientation (paragraph [0032]) applied to an MgO substrate (10). Therefore, as Hunt clearly teaches BST applied in the (111) direction provides the advantage of a ferroelectric/dielectric with the benefits of the taught invention and as Chang teaches BST may be applied in the (111) direction to MgO, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the BST film in the (111) direction on the other substrates

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taught, including MgO. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 1 and 8, the recitation of "a phase array antenna system" and "a satellite communication system" is considered intended use. In addition, devices as taught by Hunt et al. are known components of phase array antenna systems and satellite communication systems.

Regarding claims 2 and 9, the BST film completely covers the substrate (Fig. 17).

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US Patent Application No. 2003/0022030) in view of Hunt et al. (US 7,145,412).

Chang teaches a strain-relieved tunable dielectric thin film. The thin films preferably include a low dielectric loss substrate, a crystalline dielectric film, and a buffer layer (paragraph [0006]). Both the crystalline dielectric film and buffer layer may include BST (paragraph [0006]) in a (111) orientation (paragraph [0032]). The thin film is taught as a MgO substrate (10), a BST (20) dielectric thin film disposed over the substrate (10), and a single layer electrode (22) formed on the BST thin film and separated from the MgO substrate (paragraph [0038] and Fig. 5a).

Chang does not teach an interdigital single layer electrode pattern formed on the BST thin film.

Hunt et al. teach a BST dielectric thin film that may be formed with planar (col. 10: 56 and Fig. 15) or interdigital (Fig. 17) electrode pattern. Further, Hunt et al. teach

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an interdigital electrode pattern provides the advantages of larger DC biasing and less interaction with the RF signal between the main electrodes (col. 11: 15-19). Therefore, as Hunt et al. clearly teach planar and interdigital electrode patterns are both suitable dielectric forms and that interdigital electrode patterns provides the advantage of larger DC biasing and less interaction with the RF signal between the main electrodes (col. 11: 15-19), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the electrodes of Chang in an interdigital pattern as taught by Hunt et al. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 1 and 8, the recitation of "a phase array antenna system" and "a satellite communication system" is considered intended use. In addition, devices as taught by Chang are used to develop low loss tunable microwave devices, such as voltage-controlled oscillators, tunable filters and phase shifters, which are known components of phase array antenna systems and satellite communication systems.

Regarding claims 2 and 9, the BST film completely covers the MgO substrate (Fig. 17).

Response to Arguments

Applicant's arguments with respect to claims 1-2 and 8-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA



JENNIFER MCNEIL
SUPERVISORY PATENT EXAMINER

1/8/12